

**MIRABILIS MELANOTRICA (NYCTAGINACEAE), A NEW COMBINATION  
FOR A COMMON FOUR O'CLOCK FROM SOUTHWESTERN NORTH  
AMERICA**

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ABSTRACT

The new combination *Mirabilis melanotricha* (Standley) Spellenberg, based on *Allionia melanotricha* Standley, is proposed for a montane *Mirabilis* common from the southern Rocky Mountains in the United States, through the Sierra Madre Occidental, to the mountains of central México. The plant has been recognized as *Allionia comata* Small, or has been submerged in *Mirabilis oblongifolia* (A. Gray) Heimerl. Taxonomic problems are known to abound in *Mirabilis* L. subgenus *Oxybaphus* Heimerl, probably due to the presence of chasmogamous and cleistogamous flowers and xenogamy and autogamy, combined with an herbaceous perennial habit and phenotypic plasticity. Variation in *Mirabilis melanotricha* is discussed generally, and the species is distinguished from *M. albida* (Walter) Heimerl and *M. oblongifolia*. The name *Allionia comata* is lectotypified.

KEY WORDS: Nyctaginaceae, *Mirabilis*, *Oxybaphus*, *Allionia*, nomenclature

The recent completion of a taxonomic treatment of the Nyctaginaceae for the *Flora del Bajío and Regiones Adyacentes*, under production by the Instituto de Ecología, Pátzcuaro, Michoacán, México, requires a nomenclatural combination for one of the more easily recognized species of *Mirabilis* in southwestern North America. This combination is also needed for the treatment of the genus now in preparation for the Flora of North America.

*Mirabilis melanotricha* (Standl.) Spellenb., *comb. nov.* BASIONYM: *Allionia melanotricha* Standl., Contr. U.S. Natl. Herb. 12:351. 1909. *Oxybaphus melanotrichus* (Standl.) Weatherby, Proc. Amer. Acad. Arts 45:425. 1910.

For decades, species in this group of *Mirabilis* were known under the generic name *Allionia*. This name has been conserved for another genus of Nyctaginaceae, the

trailing four o'clocks (*A. choisyi* Standl., *A. incarnata* L.), which had been in the genus *Wedelia* Loefl., later *Wedeliella* Cockerell. The species in the traditional *Allionia* were transferred to *Mirabilis* by Standley (1931), but for decades were often considered to belong to the segregate genus *Oxybaphus* L'Her. ex Willd. by numerous authors. The use of *Allionia* in this paper refers to described entities for which no name in *Mirabilis* is available.

*Mirabilis melanotricha* belongs to the subgenus *Oxybaphus* (L'Her. ex Willd.) Heimerl, and is part of a complex of forms that has bedeviled students of the genus for nearly a century, not to mention those who have attempted to use their taxonomic treatments. For example, Standley in 1909 and 1911 described numerous entities in *Mirabilis* and segregate genera, only to collapse many into synonymy in his 1918 treatment of the family.

Such was the case with *Allionia melanotricha* and *A. pratensis* Standley, both described at the same time and place by Standley, collected at the same time and same place by J.C. Blumer (TYPES: *A. melanotricha*, Arizona, [Cochise Co.], Chiricahua Mts., Barfoot Park, rolling, andesitic, pine land, recently lumbered, 8000-8250 ft, 17 Sep 1906, J.C. Blumer 1385 (HOLOTYPE: NMC!; Isotypes: F!,GH!,MO!,NY!,SMU [at BRIT]!,US!); *A. pratensis*, Arizona [Cochise Co.], Chiricahua Mts., Barfoot Park, rolling, andesitic, pine land, recently lumbered, 8000-8250 ft, 17 Sep 1906, J.C. Blumer 1384 (HOLOTYPE: NMC!; Isotypes: GH!,MO!,NY!,SMU [at BRIT]!). What Blumer saw in the field (two different taxa), Standley put into print, where he noted that *A. pratensis* was obviously related to *A. melanotricha*. Indeed, the two holotypes are remarkably alike, but isotypes of *A. pratensis* are less like *A. melanotricha*. In the original description Standley also stated that according to notes on herbarium specimens, Heimerl had placed the phase that Standley was describing as *A. melanotricha* into a broadly constructed *A. oblongifolia* (A. Gray) Small. In 1911 he noted that *A. melanotricha* was one of the most variable species in the genus, particularly in leaf shape and consistency of blackness of involucre hairs. In 1903 (pp. 407, 1330) Small described *A. comata*, noting that the species had hirsute or hirsute-pilose herbage, the key indicating the stems to be "hirsute," the description saying "hairs viscid, somewhat tangled," and he indicated the species had a geographic range from "Nebraska to Texas and New Mexico." By 1918 Standley had discovered Small's name *A. comata* Small and adopted it, submerging the later-published *A. melanotricha* and *A. pratensis* as synonyms, but indicated the range to be "Arizona and western Texas, southward to Sonora and Puebla."

*Allionia comata* is typified by a C. Wright collection from southwestern New Mexico (TYPE: C. Wright 1718, N. Mex., 1851 (HOLOTYPE: at C. U., not found at NY; Isotypes: GH(2)!,MO!,US!). This collection is actually Wright's field number 314, "stony hills near the Coppermines, much branching forming large bushes, 20 Aug 1851," located in present day Grant County, near the mining village of Santa Rita. The isotypes are very uniform, to the point of appearing to have come from the same plant. According to Shaw (1987), Gray's distribution number 1718 consists of plants from only one of Wright's field numbers, simplifying lectotypification (LECTOTYPE [here designated]: US #22756). The type is viscid-villous or viscid-pubescent, but not hispid as stated by Small.

In 1931 Standley adopted Heimerl's broad view of a *Mirabilis* with several subgenera and made many numerous nomenclatural transfers from *Allionia* and other

segregate genera to *Mirabilis*. He made combinations for those taxa that he currently recognized, such as *M. comata* (Standl.) Standl., leaving synonyms in their respective subgenera. Thus, he never made the new combination from *Allionia* to *Mirabilis* for *A. melanotricha* or *A. pratensis*.

Taxonomy at the species level within the subgenus *Oxybaphus* is problematic. In the introduction to his treatment for *Mirabilis*, Shinnors (1951) expressed the kinds of biological and nomenclatural situations that plague classification. Cruden (1973) showed cleistogamic and chasmogamic flowers in *M. nyctaginea* (Michx.) MacMillan and self-compatibility in chasmogamous flowers. The floral mechanism described for *M. nyctaginea* (stamens and style curling together as the flowers wilt after sunrise) is common to chasmogamous flowers of all species of subgenus *Oxybaphus*. It probably insures self-pollination; autogamy is likely. Cleistogamous flowers are found in many other species, including *Allionia pratensis* and *M. oblongifolia*. Nevertheless, chasmogamous flowers in the subgenus are often very attractive and are visited by various strong-flying pollinators, among them various moths, butterflies, bees, and hummingbirds (as is the case in *Mirabilis melanotricha*). Thus, xenogamy is possible. Turner (1993) used the argument of cleistogamy and hybridization, combined with phenotypic plasticity, to support his concept of a widespread and variable *M. albida* (Walter) Heimerl.

Since Standley's time, approaches to the taxonomy of the subgenus *Oxybaphus* either have mostly followed his 1918 treatment or have recognized many fewer taxa. The latter approach was used in the treatment of the genus by Reed (1969) for the Flora of Texas. Reed, working primarily from herbarium specimens and literature, produced a treatment that is an invaluable entrance into the literature and nomenclature of the group, but is often difficult to use in identification of Texas *Mirabilis*. In that treatment he adopted one of Heimerl's names, *M. oblongifolia* (A. Gray) Heimerl for an extraordinarily variable complex of entities from southwestern North America. In that complex, Reed placed *M. comata* as Standley viewed it in 1918 (as *Allionia*). Turner (1993), in providing a taxonomy for the Texas species of *Mirabilis*, recognized even fewer species. He took Reed's *M. oblongifolia* and submerged it and most of its synonyms into an even broader *M. albida*, formerly a comparatively uniform species of the eastern portion of the United States. Turner distinguished his *M. albida* by the presence of a very fine pubescence beneath the larger, more conspicuous, spreading trichomes, a bilayered pubescence that is not consistently present throughout forms of *M. oblongifolia*. Nevertheless, in doing so, Turner noted that *M. comata*, although closely related to *M. albida*, was distinguishable, and he cited a single specimen from extreme western Texas.

From my own study of the type material of *Mirabilis comata*, and from my field work in the vicinity of Santa Rita, N.M., *M. comata*, *M. melanotricha*, and *Allionia pratensis* are different entities and each is recognizable locally. They occupy different habitats: *M. comata* (branched and sprawling, as Wright noted, with semi-succulent grayish, densely viscid-pubescent foliage) from clay-loam soils at mid-elevations in open woodland; *M. melanotricha* (erect, foliage bright green, with thin glabrous leaves) from valleys and slopes at higher elevations usually in meadows and openings in woods; *A. pratensis* (branching at the base with decumbent-ascending branches and rather soft, glabrous, semi-succulent green leaves, the lower of which are often purplish or lead-colored abaxially) from mineral rock in open woodland. With regard

Table 1. Comparison of *Mirabilis albida*, *M. oblongifolia*, and *M. melanotricha*.

	<i>M. albida</i>	<i>M. oblongifolia</i> (inc. <i>M. comata</i> , <i>Allionia pratensis</i> )	<i>M. melanotricha</i>
Habit	Usually erect, sometimes decumbent	Erect to decumbent	Erect, rarely decumbent
Leaves	Usually narrow, linear-lanceolate to lanceolate or lance-oblong; usually glabrous; thin to subsucculent; green to grayish green	Usually broadly lanceolate to ovate, more or less triangular, or oval; pubescent or glabrous; thin to subsucculent; green to grayish green	Narrowly lanceolate to ovate or triangular; glabrous; thin; bright green
Inflorescence	Usually with a well-defined main axis and shorter side branches; trichomes of involucre with pale crosswalls	Usually with a main axis and shorter side branches, sometimes rather compact; trichomes of involucre with pale or dark crosswalls (but if leaves glabrous, crosswalls of trichomes in involucre almost always pale)	Appearing more or less evenly forked, without a strong main axis; trichomes of involucre with dark crosswalls
Fruit sculpturing	Ribs high, pale, angular, tuberculate; sulci often with large, bract-like or wart-like tubercles; larger hairs on fruit 0.2-0.3 mm long, tufted	Ribs low, rounded, low-rugose or low-tuberculate; sulci with low rugae or low tubercles; larger hairs on fruit mostly 0.05-0.1 mm, usually evenly distributed	Ribs low, rounded, low-rugose, low-tuberculate, or almost smooth; walls of sulci similarly sculpted; larger hairs on fruit mostly 0.15-0.2 mm long, often tufted
Geographic range	Eastern half of United States and adjacent Canada	Southwestern United States and northern México	Southern Rocky Mountains and Sierra Madre Occidental to central México

to leaves and involucreal pubescence, the type of *M. comata* is also very similar to that of *M. oblongifolia*, and for the present the two represent the same taxon. *Allionia pratensis* is more problematic, but also seems to represent a glabrous phase of *M. oblongifolia*.

It is not an exaggeration to say that each species of *Mirabilis* section *Oxybaphus* intergrades with one or more of the other species in the subgenus, such intergradation now explained in some carefully studied floras (e.g., McGregor & Brooks 1986). The mixed breeding system as described by Cruden (1973) for *M. nyctaginea* is apparently widespread in the subgenus. This and the rather high chromosome numbers (the few reported in the literature or on herbarium sheets range between  $2n = 40$  and  $2n = 58$ ) can be expected to result in numerous populations rather morphologically homogenous within, but varying between, which is clearly apparent in the heterogeneous habitats of south-central North America.

Removing *Mirabilis melanotricha* from the *M. oblongifolia* complex, and not placing the latter into *M. albida*, may make *M. oblongifolia* taxonomically more tractable. For the present, the three taxa may be distinguished in most instances as reviewed in Table 1.

*Allionia pratensis* and *Mirabilis oblongifolia* often have cleistogamic flowers, particularly on plants where involucre are borne singly in leaf axils. This seems to be an early phenological phase in some individuals; the only phase in others. *Mirabilis melanotricha* is not known to have either of these phases.

Although recognizable by the combination of strictly erect habit, bright green, thin, glabrous foliage, evenly and widely forked inflorescence, dark involucre, and dark cross-walls in involucreal trichomes, *Mirabilis melanotricha* is not without its problems. Along the northern edge of its range and at lower elevations in New Mexico it intergrades with *M. linearis* (Pursh) Heimerl through the phase classified as *M. linearis* var. *decipiens* (Standley) S.L. Welsh. In northeastern New Mexico, as judged from the reddish color in fruits of some populations, it may intergrade with the widespread and vegetatively rather similar but more eastern *M. nyctaginea* (Michx.) MacMillan. In the western Texas mountains and occasionally in the Sierra Madre it appears to intergrade with *M. oblongifolia* through the phase similar to a broad-leaved form of *A. pratensis*.

#### Representative collections of *Mirabilis melanotricha*:

MEXICO. Chihuahua: afueras de Creel (norte), 2400 m., 12 Sep 1988, *R. Mateos 41* (CIIDIR, ENCB); Mpio. de Zaragoza, Chih. Hwy. 28, 0.5 km S and slightly W of summit of pass through Sierra Catarina, 26 km WSW of Buenaventura, 2290 m, 28 Aug 1996, *R. Spellenberg 12353* (NMC). Distrito Federal: Sierra de Guadalupe, 5 km al NNW de Cuauhtepic, 2500 m, 29 Jul 1971, *J. Rzedowski 28597* (ENCB, MO). Durango: km 26 de Tepehuanes hacia Guanaceví, 2000 m, 31 Aug 1989, *O. Bravo Bolaños 121* (CIIDIR, MEXU); Mpio. de SÚchil, El Taray, Reserva de Michilía, 2500 m, 28 Jul 1981, *A. Ortega A. 14* (CIIDIR). Guanajuato: 8 km NNW de Santa Rosa por la brecha a Picones, 2340 m, 5 Sep 1998, *S. Zamudio, R.M. Murillo 10830* (IEB). Hidalgo: Mpio. de Tepeapulco, Ranchería los Cides,

2450 m, 3 Jul 1976, A. Ventura A. 1722 (ENCB,MEXU,MO,NMC). México, Mcpio. de Huehuetoca, vertiente W del Cerro Sincoque, 2500 m, 3 Aug 1976, J. Rzedowski 34321 (ENCB,NMC). Puebla: Mcpio. de Libres, San Isidro, 2180 m, 29 Jul 1986, F. Ventura A. 22232 (ENCB,MEXU). Querétaro: parte alta del cerro Zamorano, 3200 m, 27 Jul 1989, J. Rzedowski 48781 (IEB).

UNITED STATES. Arizona: Apache Co., Nutrioso Creek, N of Eager, 2290 m, 5 Sep 1942, R.C. Barneby 5056 (NY); Cochise Co., Chiricahua Mts., Cave Creek Canyon, ca. 5 mi W of Portal, 17 Sep 1988, R. Spellenberg 9730 (NMC). Colorado: Archuleta Co., 8 mi N of Pagosa Springs, 2400 m, 18 Aug 1936, R. Rollins 1546 (F, MO,NY). New Mexico: Rio Arriba Co., Chama, 2 Sep 1899, C.F. Baker 303 (GH, NY); Catron Co., 17.5 mi S of Reserve, 1/4 mi S of Saliz Pass, 1950 m, 29 Sep 1972, R. Spellenberg 2924 (NMC); Otero Co., E of La Luz in La Luz Canyon, ca. 1 mi W of jxn with Bailey Canyon, S22 T15S R12E, 2 Sep 1987, R. Spellenberg & N. Zucker 9222 (NMC,NY,TEX). Texas: Culberson Co., Guadalupe Mts. Natl. Park, Bear Canyon, 2320 m, 6 Sep 1987, L.C. Higgins 17436 (NY).

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